

ZX-Appeal

Vancouver Sinclair
Users Group

NEXT MEETING:

KILLARNY COMMUNITY CENTRE
6260 KILLARNY STREET
VANCOUVER

FRIDAY; 7:00PM

November 13

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**The Black Watch.
By Sinclair.
£24.95.**



ZXApeal is a monthly newsletter put out by the Vancouver Sinclair Users Group. For more information on the group and ZXApeal see the backcover.

THIS ISSUE.....

Now that the 'Postal Snails' have decided to go back to work, mabe we can get back on track. I've decided rather than going to the bother of changing everyones expiry date (a big chore), I'm going to make this a 'double issue' (a smaller chore) to make up for the missing issue last month due to the mail strike. This issue won't be 'Mega' size, just 'bigger'.

Some of the goodies awaiting you inside: Fred N. is back with 'More on the PC8300'. (Fred would be the first to tell you that this article is actually obsolete now that he has completed work on his TS1000/ZX81 ROM for the PC8300.); Vince L. sends in an article for the 1000 detailing the installation of the 8k NVM inside a Rampak. A nice little project for those dark autumn evenings. Harvey T. continues his ever popular 'Playing with...' series, this time about everything you ever wanted to know about Telecommunication standards and protocols; Tim S. reviews Harvey's latest foray into the wonderful world of capitalistic free enterprise - namely his 'Q_Link' telecommunications program for the QL; to round out what seems to be becoming a major topic in this issue, an up-to-date list of BBS's is included for modeming fans; Ken A. offers a simple solution for all those who have lately 'lost their grip'; we reprint a not-so-flattering Globe and Mail article on Sir Clive - my comment is that the authors are full of horsechips, but then I'm slightly bias in my view; space permitting, we'll try to continue with 'Buzzwords' as well as reprint some very good memory saving techniques for the 1000; plus choice reprints from the Network.

Bits & Pieces.....

...the first NW TS Mini-Fair is now history. Some people appear to have had the idea that this event was going to be a smaller version of 'Indy/87 and might have been disappointed with what they found but I think the Mini-Fair turned out just fine - a large User Group meeting of not just one group but five. The seminars were invaluable for the information given out on the topics covered. (Two talks were given by VSUG members.) An added bonus was the attendance, with lots of goodies for sale, of R.M.G. Our own Weym!! was demoing their latest - 'The Delta Device'. Time Designs also had tablespace offering subscriptions as well as many of the fine TS books they publish. All in all a most enjoyable time for the reported 150+ in attendance.

...sadly we report that the West Coast TS Fest scheduled for this summer in San Francisco has been cancelled. No reason given.

...former member Bill Peers has moved on to other pursuits and has kindly given his 1000 system to the group. He says the 1000 is non-functioning at the moment but the printer and Rampak are just fine. I'm sure we can have everything up and running in short order. So be sure to attend the next meeting for the BIG AUCTION. Thanks again Bill!

...as you know, TIMEX still continues to manufacture computers at its Portugal facility for sale in Europe and, lately, Eastern Block countries. It is now reported that production will cease at the end of the year. Maybe my computer will no longer be made anywhere in the world but that will not effect my continuing interest in these machines. De Loreans, Bricklins, and Avanti's are no longer in production but a whole lot of people still maintain an interest and appreciation for

these fine machines. Millions of Model 'T' Fords were made - wonder what one in mint condition would be worth today?

...so you say your machine is feeling poorly and you have nowhere to turn. White Knight Dan to the rescue. Dan Elliott of Cabool, MO is offering to fix ANY TS machine or TS-related add-ons, or any other computerized equipment for VERY reasonable prices. He will even make up that neat circuit you've wanted to build but didn't think you were up to. Dan's notice is printed elsewhere in this issue.

...if you're in the market for a new machine:
- Brooklyn Closeout Corp, 167 Clymer St., Brooklyn, NY, 11211, has new 2068s complete with 2040 printer, 2 cartridges and 3 tapes for \$130.00US and they pay the shipping.

- Sharp's Inc., RT.10, Box 459, Mechanicsville, VA 23111, and other QL dealers, are giving the QL away for \$99.00US. This price is not for a kit or stripped machine - you get the software, the manuals, the cords, everything! The software alone is worth many

times this if you were to buy the PC equivalent. Mark Stueben of Sharp's tells me he has shipped over 400 units in the last 3 weeks. And this is a 'dead' machine?

...Bill R. advises he has a Rotronics Waferdrive that is surplus to his requirements. It comes with factory manuals and adjustment tapes, a toolkit wafer not released to the public, and 17 assorted 64 and 128k wafers. This machine was Damco's factory machine and is in perfect condition. Bill realizes prices on these units has dropped a tad and is prepared to entertain 'offers'.

...Bill R. also advises that the 2068 library has 35+ tapes of GOOD programs and to contact him if you want to see the catalogue.

NEW MEMBERS:

Joan Kealy, El Paso, Texas
Ian Robertson, Islington, Ont.
Hilda McKinnon, Vancouver, BC
Dean Hintz, Abbotsford, BC
Chung Chow, Vancouver, BC

RENEWING MEMBERS:

Joe E. Jenkins, C.P. Igglesden, Garrison White

...meeting date!

NOV / 87						
SUN	MON	TUE	WED	THU	FRI	SAT
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	*	*	*	*	*

-by you

The meeting was opened by Ken, the prez at 19:15 with 16 souls present. In the course of the next hour or so another 6 accumulated. Ken expressed some surprise that our sterling organization is somehow beginning its sixth year. Nobody else was surprised.

We quickly got down to it as Ken raised the possibility that Killarney Community Centre, where we hold our meetings, may soon require that we acquire some sort of insurance if we are to continue meeting there. No action is proposed at present, however notice is served that the venue may change.

Ken told us of a meeting he attended over the summer concerning blind people and computing. In particular these folks were running a speech system called Smalltalk [not the language, I think] on an Epson HX-8. There is apparently a Calgary BBS dedicated to the blind. It was agreed that VANSUG would like to hear a speaker on this topic in the coming months.

Mention was then made of the Fred Nachbaur <=== Immigration Canada debacle. The latest info is that Fred is to visit Immigration on Sept 23/87 for a physical & a security check. Reportedly he will be doing a Seattle shuffle at some future date. He will be unable to make the Seattle fest because of worries about getting back into the country; however there is a good chance we will see Fred at a meeting later on this year.

Rod Humphrey then stood to make his Editor/Treasurer report. Coyle he asked how people liked the summer Mega ZXAPPEAL & when the cheers & hollers died down, he told us what it cost --- \$90 printing and almost \$90 postage. In spite of which we still have approximately \$600 in the credit union. There then ensued some heavy persuasion with regard to member profiles. Send Rod one quickly, or he'll make one up about you!

Ken then went through a list of upcoming events. First is the CUEBEC [Computer Using Educators ...] conference which costs a mere \$122.00. Next is the PCCFA [Pacific Coast Computer Fair Association] which is holding its yearly bash on Oct 17/87 at McPherson Centre. Finally came the Seattle Sinclair Fest which will have been held by the time you read this on Sept 26/87.

There was no TS1000 library report as Ian had a bout of the flu. Kevin Kernay was shanghied into being the keeper of the books in lieu of Ian.

Then strangeness descended. It seems that during the summer, a certain gentleman from Cleveland, one Al Geddes (sp?), passed through Vancouver on his way to an island and he dropped off the entire Cleveland Users Group TS2068 library. This consisted of 25 separate C-60 tapes each of which holds approx. 50 programs. These are mixed 2068 & Spectrum programs. Not all have been recoverable due to bad media. There is no masterlist of the material present. So suddenly the 2068 people have one monster cataloguing problem. Bill Reutter has been collared with the library, but nobody is about to volunteer for such a cataloguing task.

It seems that Dave Ross, esteemed member & semi-dealer, is moving upcountry to Williams Lake. Get a modem Dave!

[On the Telecomm note, let me remind you all that there is a Sinclair Sub-board on City-Link (604-222-2000) in the micro room. Check it out!]

Harvey then stood and mentioned that he had brought some Transputer & QL information for those interested. He then raised the possibility of a club purchase of a Re-Inker. Much discussion ensued & no decision was made. Harvey then described the product TEC-200 which can be used to make PCB's directly from a photocopy.

Glenn Read stood to tell us of the non credit courses available from UBC this fall. Rusty Townsend, ever the practical one, mentioned that he had brought a map of Seattle for people to check out the Fest location.

It was mentioned by Ken that the printed material picked up last spring was ON LOAN, not a gift. It was agreed that suitable labels should be made up for this material to serve as a gentle reminder of its actual status. Harvey volunteered to print such labels & then a wild group fantasy spiralled through making up rubber stamps, removing adhesive labels & dusting for fingerprints with Ultra Violet powder.

Ken then showed us some Fisher Technik propaganda on modular robotics kits he had received. He also showed us a couple of books he had received from Zebra, one of which was the Mazur 2068 book with a colorful history. It seems Sams had it in the can when Timex folded & Sams killed the book. A letter writing campaign by Sinclair fanatics got them to release the book, which was described as a teaser. It says several things are possible, but doesn't say how!

Rod mentioned that the Indian tapes would be forth coming through the winter. Wilf Right then gave us a sneak preview of his upcoming Seattle talk. The 3 Novram board was passed around. The meeting then dissolved in general merriment & mayhem.

October 9/87 Minutes

After a vicious diatribe directed at the alleged tardiness of your most faithful & deserving scribe by running dog lackey el presidente Ken, the barely elected, the writer of these lines took out his ear plugs and the meeting was dragged into a semblance of order. There were 17 present; 5 stragglers came in later.

First off, Rod missed the meeting due to visiting rugger buddies from down under, so there was no editor's report. It was generally agreed that Rod is doing a class one job & ought to be congratulated & stroked by all members -- frequently. Ken mentioned that Rois Harder was going to sell off some stuff before the next meeting, so come early if you're in an acquisitive mood. The next meeting, by the way, is Friday the 13th -- anybody wearing a hockey mask will not be admitted. Ken described some software which Fred Nachbaur has donated to the club library, both hi & lo res stuff. Fred has now been declared fit by Immigration Canada. He has yet to get a security clearance and then do the Seattle shuffle.

Ken mentioned that there was an upcoming Computer Show in Toronto and wondered aloud if anybody were going to it. There was then a good deal of chatter about the Sinclair Fest in Seattle. Some poeple went through a lot of hassle crossing the border. The 1988 Fest is scheduled for Portland & the 1989 for Vancouver.

Ken Grant stood at this point to say that he had run into a bit of a problem with his JIL-JT115 tape recorder & had got some circuit diagrams which he had xeroxed for the group.

Rusty Townsend reported how he had spent 16 hours going over one of the 2068 library tapes we inherited. There were 94 different programs on the one tape, packed very tightly. The quality of these tapes is

marginal apparently & there is also some software currently on the NorthAm market. The club will be removing this material from circulation. There were at several points throughout the evening, questions & worrying of the copyright question. It seems to be the opinion of most members that NorthAm vendors & software authors ought to be protected. These are the last people we want to drive out of business.

Ken, el supremo, delivered a partial financial report. We have approx \$500.00 smackeros with several bills outstanding. There are at present 78 club members, Glenn Read tells us. [He is the keeper of the mailing list.] Harvey passed around a provisional library book label for comment & suggestion.

At this point we were subjected to another diatribe from the prez. This time it was to encourage each & every one of us to sit right down & write out a MEMBER PROFILE. This goes for you out of towners as well. It would be nice to see Software/Hardware lists, as well, but we weren't dreaming in technicolor this evening.

Ken the prez, reported that the club had a copy of Peter Fishers book on Telecomm. The book has been released into the public domain & clubs are encouraged to make copies. About 14 people present were interested in copies. Ken seems to think a xerox copy will be about \$3.00. If any out of towners are interested, drop Ken a line.

Gerd Breuning stood to make a PCCFA [Pacific Coast Computer Fair Association] report. This is an umbrella group which exists to foster the use & enjoyment of personal computers in its 12 member user groups and the general community by organizing swap meets, computer fairs, etc. There is an upcoming swap meet in Vancouver on Sat. Oct. 17 at McPherson Centre. The PCCFA is looking for new blood if anybody locally is interested. Gerd has volunteered to be a club rep.

At this point there was a spate of hair pulling as Ken, Harry & Marcio played Display, Display who's got the Display (for the club table at the swap meet).

Ian McLean, the ZX81 Librarian, has decided that because there has been no problem whatsoever with materials borrowed from the library he is going to the honour system, ie no lending fee. He is looking for a case to transport the 150+ tapes. There is also the possibility of some interclub trading coming up.

Bill Reutter, the 2068 Librarian, made a plea to 2068 people to take some of the Cleveland booty to make a club copy & catalog what's on the tapes. He wondered what sort of system he should be using as librarian & decided he would go with no system, to general merriment. Bill had a supply of C-20 computer grade tapes for sale at \$.55 each. They were snapped up quickly.

Kevin Kerney is finding that the books in our library provide an adequate body building regime. He is carrying both ZX81 & 2068 material now.

Harry Slot reported that the hardware SIG is meeting regularly. Wilf offered a 32K-NVM deal to members. The bottom line is build a board for Wilf to get a free board plus the software package. He is arranging this in a workshop format in the near future. His board works with the ZX81 & PC8300, and he is investigating the 2068.

Bill Reutter raised the great copyright debate again. He was wondering whether the old Byte Power material should be in the library. It was decided if there is any complaint, questionable material will be removed.

Marcio told us that Guido's BBS is on a permanent back burner due to a defective interface.

There was a new/old member, Dean Hintz, who has moved back to Vancouver from Toronto and there is a new/new member Chung Chow who comes to us from the UK.

As we had gone on so long with everything, there was no time for a presentation. The meeting dissolved into fun & merriment.

```

1 REM "1K ZX81 FROGGER"
  BY G. WILSON

2 REM  PRESS "1" TO MOVE FROG

10 CLS
20 LET A=4
30 LET B=5
40 LET X=2
50 LET Y=3
60 LET F=5
70 LET E=X/X
80 LET S=NOT PI
90 PRINT "  FROGGER  "
100 PRINT "          "
110 FOR U=1 TO 4
120 PRINT "          "
130 NEXT U
140 PRINT AT 1,0;"  "
150 PRINT AT 2,E;"  "
160 PRINT AT 3,F;"  "
170 PRINT AT A,B;"F"
180 IF E=9 THEN LET E=1

190 IF F=0 THEN LET F=8
200 LET E=E+1
210 LET F=F-1
220 LET X$=INKEY$
230 IF INKEY$="1" THEN LET A=A-1
240 PRINT AT A,B;"F"
250 PRINT AT A+1,B;" "
260 IF A=Y AND B=F THEN GOTO 30
270 IF A=X AND B=E THEN GOTO 30
280 IF A=1 AND B=5 THEN GOSUB 3
290 GOTO 140
300 CLS
310 PRINT S;" FROGS HOME",,,, "P
RESS "ENTER" WHEN READY"
320 PAUSE 4E4
330 RUN
340 LET S=S+1
350 LET A=4
360 LET B=5
370 RETURN

```

KEEP THIS HANDY FOR FUTURE REFERENCE. SHOULD YOU NEED REPAIRS, UPGRADES, OR TECHNICAL ASSISTANCE, I'M HERE TO HELP. Dan

Service Charges for Home Computers effective October 1, 1987

Prices include return shipping/handling anywhere in continental USA. Elsewhere, add \$5.00 to each price quote below.

Also add an additional \$5.00 for repair of each piece of modified equipment. Definition of modified equipment: Any circuitry changes on the inside of the equipment case that involved the addition of components, wires, integrated circuits or hardware. Customers who send in computer equipment that has had modifications done to it, which change the manufacturer's original design, must pay the additional \$5.00 for repairs.

1. The following computer types will be repaired for \$15.00 + parts

TS-2068 Commodore 64 C-16 TI-99/4A

VIC-20 PLUS-4

2. The following computer types will be repaired for \$25.00 + parts

Coleco Adam Commodore 128

3. For repairing add-on modules, printers, monitors, or other computerized equipment not listed above, write for a price quote for the item(s) you want repaired.

4. For modifying or upgrading any Timex computer, rampack, or other add-on module - \$15.00 + parts.

5. For assembling and testing custom circuit boards - write for a price quote.

6. Customers can expect a 4-6 week turnaround on all repairs or upgrades. You will be notified by mail if additional time is needed. You will also be notified if the total repair bill might exceed \$40.00. In any case, the minimum service charge will be \$5.00 per item.

Instructions for sending in computer equipment.

1. For repairs, please use a separate sheet of paper to describe in detail the problem you are encountering, and whether or not the problem is intermittent. List any software or hardware that are associated with the problem. Also list any modifications that have been done to your equipment.

2. For upgrades, list the magazine article(s) or source of information for doing each upgrade.

3. Carefully pack and ship your equipment to the address below via UPS or parcel post.

DAN ELLIOTT
Rt 1, Box 117
Cabool, MO 65689

PHONE (314) 739-1712 EVENINGS, SUNDAY THROUGH THURSDAY.

ISDN - Integrated Services Digital Network

The telephone is an analog device. Sound waves produce an amplitude modulated signal on the telephone wires. This is why you need a modem to talk to another computer. The digital signals in your computer are changed to an analog signal the phone company can handle and the modem at the other end changes the analog signal back into a digital signal for that computer(hopefully). Wouldn't it be nice if you could make a digital connection to the other computer....

The Vision:

Imagine what it would be like to be able to phone a friend, talk to her on a videophone while exchanging computer files on the same phone line @ 64K Bits/sec. Science Fiction? Read on...

The Reality:

In short, not all of the interfaces & protocols have been defined & it is a standards jungle out there.

The CCITT [Consultative Committee on International Telephone & Telegraph] has produced a series of guidelines. This involves a seven layer Open System Interconnection [OSI] model developed by International Standards Organization [ISO], often called the ISO-OSI model.

These layers are:

7 APPLICATION	-----	Distributed computing
6 PRESENTATION	User	Formats data: compression/encryption
5 SESSION	Levels	Sets up & closes down sessions
4 TRANSPORT	-----	Error free end to end communication
3 NETWORK	-----	Routing
2 DATA LINK	Vendor Levels	Transfers groups of bits (frames)
		Error Detection/Correction
1 PHYSICAL	-----	Transfers encoded bits

To implement this model, there are several different levels of interfaces envisioned:

R - Connects a non-ISDN terminal to an ISDN terminal	-Defined
S - Connects an ISDN terminal to an ISDN PBX/Terminal controller	-Defined
T - Connects an ISDN PBX/Term. Controller to Network Termination	-Defined
U - Network Termination	-Not Defined
V - Inter Exchange level	-???

The U level interface has not been defined because there are national differences in the existing phone systems. The North American interface is being defined in late 1987 by ANSI. Major portions of the Layer 2 & 3 protocols are covered by the X.25 standard.

The Physical Layer 1 is presently defined as:

1) Basic Rate Interface @ 144 KBits/sec 2 B channels @ 64 K Bits/sec and 1 D Channel @ 16 K bits/sec. This is commonly called 2B+D. The D channel is used for error detection & correction, flow control, etc. The B channel is used for voice/data. Voice data will be encoded by Pulse Code Modulation using Micro-law digitization. The sample rate is 8 KHz and the resolution is 8 signed bits.

2) Primary Rate Interface @ 1.544 MBits/sec (23B+D) in North America. [2.048 MBits/sec (31B+D) in Europe] for connection to PBX's. This is nearly identical to a common Interexchange connection called T1 [CEPT in Europe]

There are several different groups involved in bringing you ISDN. These are the Service carriers, Chip makers and Equipment vendors. Faced with this situation the chip makers are implementing circuits for different parts of the various interfaces & which handle different layers, sometimes multilayers, of the ISO-OSI model.

These are some of the ISDN chips currently being produced.

- AT&T - T7250 Unite- U interface circuit -
- ITT - UIC - U Interface Circuit (not available?)
- AMD - Am7930 - Voice/data (S/T interface) A/D & D/A, DLC & microprocessor interface
- Am7931 - Data - S/T interface, DLC & microprocessor interface
- Am7936 - Subscriber Power controller 5v
- Am7938 - " " " 40v
- Intel- 29C53 - S interface
- 29C48 - R interface codec-filter
- 2952 - HDLC Controller
- Mitel- 8894 - 1 chip speakerphone
- 8972 - Digital Network IC - U interface circuit
- 22 chip family all told
- Harris HC5590 - U interface
- Motorola & Northern Telecom- S/T interface
- Dual Data Link Controller
- U interface Layer 1 only
- National Semi - TP3410 - U interface *not released*
- TP3420 - S/T Interface Layer 1 only
- HPC16400- OSI layers 2 & 3
- Siemens AG - SBC2080 - S interface (ISDN-subset)
- SBC2070 - Communications controller -
- Link Access protocol control
- SGS Semiconductor - S/T interface

One of the complexities which is arising for circuit designers is the fact that there are several different methods being used for interchip communication. For example, the Mitel family use a serial bus called the ST - Serial Telecom, the Siemens family uses the SLD - Subscriber Line Datalink and the IOM - ISDN Oriented Modules, the Signetics family uses IST - Integrated Services Terminal. Most of these devices are compatible with the major microprocessors on the market, but it is clear that a designer will pretty well have to choose one family or another. (As indeed the manufacturers intended!)

Of all the groups involved, the equipment makers are being the most reluctant to throw their lot in with ISDN, because of the unfixed U-interface & the undecided higher level protocols. Mainframe users want the system to be compatible with the SNA (IBM- System Network Architecture), for example.

The Service vendors have a market already for their corporate telecommunications products & they are in some cases implementing subsets of the ISDN protocols in order to satisfy the present need. For example, in Japan, Nippon Telephone & Telegraph set up a system called Information Network System (INS) in 1984 which they are

planning on making fully ISDN compatible by 1988. Mitel offers its business customers the option of setting up a private digital network now based on their proprietary Digital Network. The idea seems to be to go digital now & connect with the major public systems when they implement ISDN.

There are many field trials taking place around the world. You have probably heard about Pacific Bell's Project Victoria which allows 7 simultaneous communication channels on one existing line, but every one of the 7 major American regional holding companies is holding at least one and sometimes several such trials. The most ambitious is being held by Mountain Bell in Phoenix where they are putting 200 Basic Rate Interfaces [BRI's (2B+d)] in the Arizona State Government, Honeywell, and Telegroup. By the end of 1987, the number will be up to 1000 lines.

Bell Canada, at present, runs with 20% on digital switches, and they are projecting 59% in 1995. In West Germany, Bundespost plan on having 70% of their commercial customers on ISDN by 1990. British Telecom plans on having 180 ISDN exchanges by the end of 1987. In France, where 45% of customers are already connected to digital exchanges, PTT has introduced ISDN services in Brittany & Paris.

ISDN is coming & once it starts, it will quickly become universal. The question then will be of extensions to the standards established.

Consider a video signal; a picture with 1000 X 1000 resolution requires 1M bits. If you are transmitting 30 Frames/sec, the data rate is 30 MBits/sec. If you wish to have a colour palette of 16 bits, the data rate jumps to 480 MBits/sec. Note that to get a feel for the numbers, these calculations ignore data compression which would likely be used.

To transmit a picture of 256 X 256 pixels with 3 bit planes @ 30 frames per second would still require 5.76 MBits/sec.

For a commercial customer, an optical link is not out of the question. There are at present optical couplers which support a data rate of 1.7 GigaBits/sec. Data rates of 10-100 GBits/sec are not out of the range of possibility. These technical possibilities and the ever present business pressures for bigger, faster, better will lead to a range of ISDN Interface Rates being made available.

For now, cost effectiveness dictates that the process begins in the corporate community with a large volume of data to transfer. Soon, we will all be connected at 64 KBits/sec minimum.

I would like to be able to leave you references so you could further investigate this fascinating system by yourself, but there are no books with information on ISDN. The thing to do is get a hold of the Applied Science & Technology Index to Periodicals at your local library & check out the Integrated Services Digital Network articles listed. These are some of the articles I found:

Electronics, August 21/86, Page 57

Electronics, October 2/86, Page 55

Electronics, October 16/86, Page 135

Electronics, February 19/87, Page 31

AT&T Tech Journal, Jan/Feb/86

AT&T Tech Journal, Mar/Apr/87, Page 27

High Technology, Aug/87, Page 26

Electrical Communication, Vol 61, Number 1/87, Pages 57, 64

Computer Design, May 1/87, Page 22

IEEE Spectrum, Jan/87, Page 42

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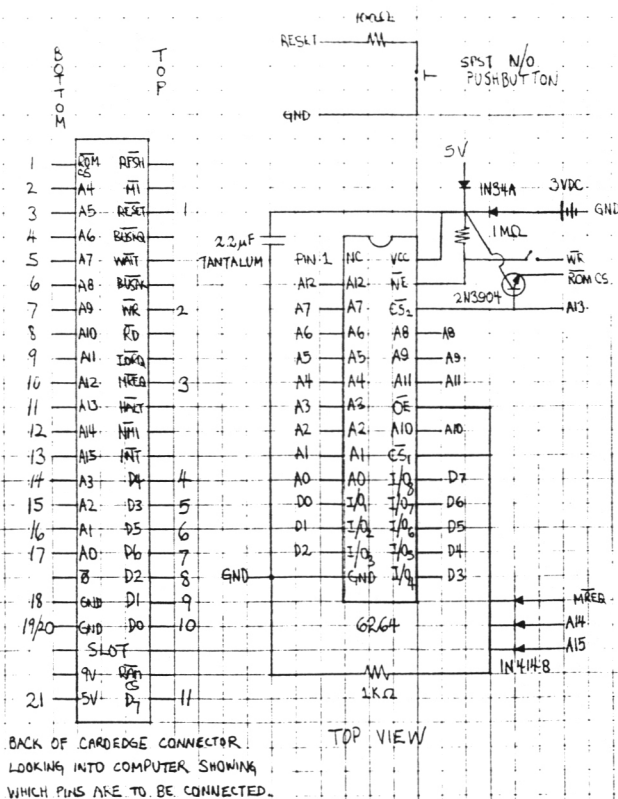
The long weekend last month offered the perfect chance to finish off some of the old projects that I had started. I was just thinking of last years NUM project when the idea occurred to me that it could be attach to the TS1016 Rampack using point-to-point wiring.

The 1016 is held together by 4 sets of screws; two on the front at the bottom and two on the back at the top. Inside are two circuit boards joined together at the top by a ribbon cable. Since all the signal lines are present behind the card edge connector on the other side of the board, this would be an easy way of connecting circuits to the TS1000 without having to open up the computer or having to make up a printed circuit board. A soldering iron with ground should be used since heat would be applied directly to the board.

The easiest method of construction would be to build the circuit up onto perf board and then use ribbon cable to connect it to the rampack.

With careful planning, the circuit can be built to fit inside the 1016. Since there isn't much width between the boards, the legs on the 6264 IC will have to be bent back. Augat manufactures an IC socket (740-AG4D) which contains only the pins. Use wire wrap wire to connect the pins to its respective signal lines in the order that is shown in the diagram and then attach it to the 6264. (I used 28 guage ribbon cable which didn't leave much room). Drilling some small holes into the top and into the bottom of the Rampack casing will prevent over heating and covering all exposed leads with tape will prevent shorting. The Reset switch, the Write Protect switch and the batteries will still be mounted externally, but for compactness, the Reset and Write Protect switches can be omitted.

For more information on the NUM, the original article appeared in the JUL/AUG 86 ZX-Appeal with a slight modification that appeared in the DEC 86 issue. It has also been published in Syncware News. One further addition has been a 2.2uF tantalum capacitor connected between pin 28 and pin 14. This has made the circuit more reliable.



Program: Q_LINK
 Manufacturer: Meta Media Productions
 Program Author: Harvey Taylor
 Cost: \$19.95 + \$2.00 shipping
 Address: 726 West 17th, Vancouver,
 B.C., CANADA, V5Z 1T9

For some time I have looked for a good terminal program for the QL that included XMODEM. I have tried one other program that had XMODEM but with unfavorable results. Q_LINK is not only GOOD and well thought-out, but it actually works!!

The features are:

- Menu or quick-key access to commands
- XMODEM or ASCII (with XON/XOFF) file transfers
- Built in EDITOR accessible from within comm
- Alterable SER device on-the-fly
- Text in buffer is MARKable for selective uses
- Configurable Modem commands
- Auto-dial and re-dial through modem commands
- 20 user-configurable MACRO commands
- 40 phone number storage
- Multitaskable
- NO COPY PROTECTION

The one major drawback of the QL is its serial ports. I shudder whenever I look at the schematic of that section! The task is handled by two LSI chips already burdened with other functions. The receive part of the serial section is handled by an 8749 uC, which also handled the keyboard scanning. In fact, there is only ONE RECEIVE PORT! This port is shared via multiplexing the handshaking signals for the two ports. This has really caused programmers grief trying to write a good telecomm program....

Harvey Taylor's solution...

Q_LINK is an excellent solution to the QL's telecomm dilemma. Using the MODAPTER PLUS at 300 baud worked well, as expected. The MODAPTER PLUS at 1200, however, was a flop! I then wired up a cable, as described by Harvey in his very good manual, and 1200 baud then worked. I used this cable for the remainder of my observations in this review.

Following the manual I BACKED UP THE COPY, and then added my signons, BBS numbers, and modem commands for my Hayes compatible ADC modem, to the copy of Q_LINK. I dialed up a local BBS (MicroLink) at 1200 baud, and performed my 'normal' activities without loss of characters or garbage. So far, so good. Command access in this program is GREAT! While learning to 'get around' you can use the quick-key method that exists for most commands (i.e. <CNTRL> + <SHFT> + <S> sends a file via XMODEM). Both methods co-exist so you can still use MENUS in little used areas that you might forget a month from now.

XMODEM

Since this is the part of the program I'm most interested in, I spent a lot of time with it. While in the local BBS I downloaded a small file via XMODEM at 1200 baud. It worked beautifully! Next, I warmed up my trusty CPM+ based machine and hooked up the QL directly. On the CPM+ machine I use IMP (Improved Modem Program), which is one of the latest public domain XMODEM programs. I did a series of xfers at 300, 1200, 2400, and 9600 baud via XMODEM AND ASCII xfer. The results surprised me! ASCII xfers worked in both directions at all speeds with only an occasional dropping of characters at 9600. Adding a small time delay after LF on the host (CPM machine) cleared that up! XMODEM xfers worked in both directions and at all speeds except 9600. It sure is nice xfering a file via XMODEM at 2400! The only problem I did notice was if the QL's serial buffer overflows you'll get incomplete messages from the host. This was mentioned in the manual and the only way out is... RESET.

EDITOR

The built-in editor is used to manipulate the text buffer in the program. Although it doesn't have ALL the features, it does the needed job. The only thing that confused me at first was the MARK function. The manual just stated what it did, but now how to use it. To use, simply position the cursor to the start of the block to be marked and execute

<CNTRL> <S> (or go through the menus), then position the cursor to the end of the block to be marked and execute <CNTRL> <E> (or go through the menus). Now you can use any block oriented command such as PRINT or DELETE to manipulate the marked block. It would be nice to see a visual change in the MARKED block, such as a change in the text color, so that I can easily SEE the block that is marked, HARVEY?? Printing the buffer is straight-forward although your printer must be set up to execute a CR when it receives a LF.

The manual is complete and well written and although the finish is not high quality, the PROGRAM IS! I would highly recommend this program to anyone who is serious about telecomm or inter-computer xfers. It is worth twice the \$19.95 that is charged (Harvey, you didn't read that!).

-Tim Stoddard

HAVE YOU LOST YOUR GRIP?

TS2040 Friction Feed Problem

by Ken Abramson

Have you noticed that the old 2040 printer is not very consistent in printing its characters the same size? Is the character size large when the paper roll is small, and small when the paper roll is full?

This problem was occurring on my 2040 printer until I clued-in to the fact that the rubber roller that fed the paper had lost its grip. What to do? I used a Q-tip dipped in RUBBER DRIVE CLEANER to restore the grip of the rubber. Be careful to wipe any excess with a paper towel, and try not to get it on the print head bar. The brand I used was "VITA DRIVE," manufactured in N.J., but other brands may work just as well.

For a friction-feed printer to feed the paper properly, the feed roller(s) must not glaze over, and the rubber pores should not be filled with fiber fragments from the paper. Hmmm... maybe I'd better make this roller-cleaning an annual event!!!

META MEDIA PRODUCTIONS 726 WEST 17th VANCOUVER, BC CANADA V5Z 1T9

Meta Media Productions Announces Q_LINK

A complete Telecommunications package for the QL
Featuring Autodial, Redial, Integral Editor, Xmodem & Ascii
File Transfer, Zoom printing for speed, XOFF/XON handshaking
Edit your session, mark a block, then print it, save it or
transfer it to another BBS. Store up to 40 Telephone numbers
& 20 Signon passwords per setup file. Edit BBS phone numbers
& names, Signons/passwords painlessly to create setup file.
Load another Setup File for even more Numbers & Passwords.
Extensive use of Menu/Quick modes suitable for novice/expert.
Configures to any modem, Set 8 Separate Modem Commands and
Messages such as Dial, Immediate Redial, Reset : Supports all
QL Baudrates:100% Machine Language:Compatible with JSU, JM ROMs
[Comes with 3 Utilities - Unsqueeze, Delibrary & Filters]
The Fine Print: US\$ 19.95 + \$2.00 shipping
Supplied on MDV or 5.25" disk [specify tpi]

META MEDIA PRODUCTIONS 726 WEST 17th VANCOUVER, BC CANADA V5Z 1T9

He was the darling of the high-tech press, a knight, his name a household word. The only problem was that most of his inventions didn't work.



Sir Clive sits atop the C5, a battery-powered tricycle.

Clive Sinclair's mystique part style, part science

BY PAUL KORING

Special to The Globe and Mail

LONDON

It was called QL, for Quantum Leap, and it was supposed to be another of Sir Clive Sinclair's triumphs. The computer press swooned.

"Each of Sinclair's machines has been more amazing than the one before but this time he has really excelled himself," said Practical Computing.

"It is impossible not to be carried away by the QL... We can safely nominate it as Machine of the Year," said Personal Computer News, although 1984 was barely a month old.

The enthusiasm was understandable, but it was flawed. "Uncle Clive," as his hordes of devoted computer fans called him, was surfing a wave of success.

Prime Minister Margaret Thatcher had paid him tribute as the perfect example of the inventor-entrepreneur, the kind of genius who would lead Britain's economy into a bright new high-tech renaissance. She

had him knighted. He was named "young businessman of the year." The Royal Society honored him with the prestigious Mullard Award for "outstanding contributions to the advancement of science or engineering of technology leading directly to national prosperity in the United Kingdom."

By the end of 1983, he was a millionaire, a household name, the chairman of Britain's Mensa — the elite group of super-intellects. His best-selling ZX81 home computer had introduced millions to home computer basics. The ZX81 was the Timex of computers, and the watch manufacturer built and sold Sir Clive's products in North America.

But the wave had crested.

The QL didn't work. No operating machine existed when the slavish reviews were published, and when the production line finally got under way, the first mail-order machine was returned, non-functioning, within a week. QL lasted less than a year. Other machines were just as capable, cost less and we-

SIR — Page B2

● From Page B1

ren't plagued by unreliability and delays. The Quantum Leap became Sir Clive's first step to disaster.

It was soon followed by an even more embarrassing leap of misguided faith. Sir Clive's second love was transportation and he had long wanted to marry electronics to a clean, personal vehicle.

Less than a year after non-working QL computers were unveiled, Sir Clive launched the C5, a "revolution in private transportation" that turned out to be a battery-powered trike with pedals for coping with even the slightest inclines. But this revolutionary transport couldn't cope with them.

Sir Clive's empire and his reputation were in ruins. The computer company and the Sinclair name

were sold for a paltry £5-million (\$10.8-million) in April, 1986, to his prime competitor, Amstrad Computers.

Instead of taking his visionary statements — "there'll be robots to go out to the Third World with real intelligence and endless patience to educate vast numbers of people" — seriously, Sir Clive was suddenly being lampooned as a failed marketer.

"The Sinclair myth... (was) an insidious chimera fostered by assiduous self-promotion (and) short-sighted business practices that resulted in a sequence of products plagued by technical faults and poor customer service," was the verdict of a critical assessment of the rise and apparent fall of Sir Clive in a book published last year.

In retrospect, finding fault was easy. Sir Clive's calculators did blow up (one in an ambassador's pocket). The C5 was a joke, miniature TVs failed to catch on and Sinclair computers had a long history

of delivery delays and failing to live up to promised performance.

Anyway, Britons like their boffins to be tweedily absent-minded with unmatched socks, not Porsche-driving, sharp dressers with expensive Italian shoes and not a trace of modesty.

His products came to be derided as mere copies. Critics sneered that Sir Clive's talent was for marketing rather than inventing, that he was an "assembler" of bottom-end gadgets rather than a leading figure at the forefront of technology.

The boy who had dropped out of school at age 17 and launched a career selling mail order radio kits from a friend's apartment grandly described in advertisements as Sinclair House became the "Midas who lost his touch" in a Financial Times of London story.

"It would be simplistic to conclude that Sir Clive is merely the victim of his own propaganda, although there is certainly an element of truth in such a view," was the finding of Ian Adamson and Richard Kennedy, co-authors of Sinclair and the 'Sunrise' Technology.

"Although the products were promoted with the promise of new technology, their development was an exercise in style rather than a commercial scientific endeavor," they added.

Sir Clive was, and is, entirely unfazed.

He airily dismisses the firesale

disposal of Sinclair Computers. "We got into a financial bind so we chose to sell the problem."

The C5 was "a stepping stone that I tripped over," he added.

The collapse was the most serious, but hardly the first, setback in Sir Clive's roller-coaster career.

In 1979, staggering losses had forced the state-owned National Enterprise Board to take over Sinclair Radionics.

Undaunted Sir Clive re-emerged with Sinclair computers. He clearly plans another comeback.

His new company, Anamartic, means "without fault" in Greek and presumably refers to the large wafer integrated circuit it hopes to develop, rather than any admission of previous failures.

Sir Clive now has another new computer on the market. Called the Z88, Sir Clive describes his laptop

computer as "the first really lightweight machine" and promises it will be the first of a whole new line.

"We won't be doing any 'me-too' products, we'll only be going into areas where we can truly innovate," he said.

It may be too soon to tell. The memory chips that were supposed to give the Z88 a massive advantage over other laptop computers won't be available for months. In the meantime, the computer will have to rely on its low price, £249, and the not inconsiderable affection Sir

Clive still commands among computer buffs at the low end of the market.

"I'm delighted to be inventing again," he said. "I enjoy thinking, I'm not a workaholic." His visions for a society transformed by personal computers and futuristic transportation (both presumably invented by him) remain unshaken, although, just occasionally, there is an uncharacteristic note of caution.

Asked about a successor to the C5, Sir Clive said: "It's quite a long way off. The trouble with transportation is that you can't do it on a small scale; you have to do it on a very big scale and I haven't got that sort of funds."

System Name Hours Bps rates Phonenum

Open Road BBS!	930p-730a	984-8278
The Abacus	24 down SUN	985-2890
Able's BBS	Soon 24h	524-5744
Advantage Comp	12p-9a	3/12 430-2442
Agora BBS		3/12 463-4811
The Apex		321-4581
Apple Tree		594-1456
Audiomat		3/12 263-8487
Basic'ly		3/12 584-9811
Battlefort. Macr.		535-0275
Bearcub's BBS		3/12 879-0693
The Beast Board		3/12 585-7391
Binary Stock Exch.		3/12 266-1531
Bit by Byte BBS		3/12 581-6310
Black Knight BBS		437-6432
Black Tower		591-5856
Bottom Line		3/12 583-1085
The Bridge		273-8217
Broadway BBS		3/12 435-9427
Burnaby		3/12 524-9564
Caesar's Den		3/12 591-3020
Call of the Wild		3/12 597-1964
Castle AARGH!		327-9494
Catalyst		3/12 872-6968

Cirrus	3/12 535-1382
CityLink	3/12/24 222-2000
Cocotech	596-1243
Code Yellow & Black	589-5365
CommNet	12 594-5954
Commodore CC	3/12 271-1082
Compuserve	738-5157
Computer Kitchen	538-3839
Compu Zone BBS	733-6432
Comstar	3/12 521-0886
Country Corners	534-9154
Critical Mass	3/12 590-8283
Crunchy Frog	937-5132
Danger Zone	420-0064
Dataline	3/12 589-3257
Datanet	3/12 299-9196
Datapac #1	689-8601
Datapac #2	12 689-8003
Datapac	12 687-7144
Dead Zone	3/12 534-3206

Delta 80		3/12	585-0680	Silver Bullet BBS	3/12	873-3640
Dial-a-File	22	12/24	879-3453	Smokey Mountain	3/12/24	462-8753
Domain			986-0310	South Delta TI 11p-6p, 24 wknd		943-0664
Electric Co. Apple AE		3/12	273-5394	Spectrum Board	12/24	738-7606
Farthest Reach			980-9886	Stardust Gallery		687-0168
Fast Plus Master		3/12	594-7398	STraightline BBS	3/12	731-5060
Fort Fantazia			888-5105	Sungod Country		943-3358
Frog Hollow		3/12/24	937-0906	Sunshine BBS	3/12	943-1612
Genie (half duplex)		3/12	437-7313	The Swamp		581-0393
Greenwood II PAF/BBS		3/12	438-1329	Swingaxle Retreat		597-2459
Guy's N' Gals	12pm-9am	3/12	435-6662	S.F.U./MTS		294-4180
Hacker's BBS			589-0683	Tandy BBS	9p-9a	581-3454
Hav Info (Info database)			682-1991	Terminal Bypass apl only	12/24	731-2543
Hem Board		3/12	929-3776	Terminal City		731-6966
Hilltop Exchange		24	521-0281	The .38 Special	3/12	980-3238
Hyperion BBS		3/12	685-4578	T.R.A.C.E.		272-5888
Iblis BBS		3/12/24	872-2316	Tranquility RPGS		942-5809
INET 2000 #1			1-800-663-0471	Tymnet		683-7620
INET 2000 #2	12		1-800-662-1911	UBC Line		228-9051
Jacks or Better		3/12	939-1149	UBC Net	3/12	228-1401
The Lab		3/12	522-4242	UBC Nimnet		228-5011
Lazy Bear's Den		3/12	291-2226	The Underground		872-0139
Leetec Info Serv.		3/12	987-3799	Underworld BBS		594-9673
Lost Paradise	9p-3p		536-2491	User's Choice		530-4722
The Matrix		3/12	525-0323	Vancouver FOFlight	3/12	271-5934
Mind Link		3/12/24	533-2312	Vanc'r PC Users BBS	12/24	434-3434
			278-5543	The Wasteland		530-4122
Mind Meld BBS		3/12	438-7865	A Wayward Sparrow		984-6984
Mirages			291-8255	West End 99 BBS	3/12	421-3717
Moonstar	10p-10a	12/24	434-4945			
Multitech BBS		3/12/24	733-1383			
Network XXIII			943-1176			
Northern Lights		3/12/24	588-0789			
Oneiro's Oracle			430-4419			
Open Road BBS	930p-730a		*984-8278			
OS9			536-0024			
The Other Side		3/12/24	588-7562			
Ouija Board		3/12	434-8155			
Out-law BBS		3/12/24	591-3472			
PacCom1		3/12	666-2981			
Pacific Systems Grp.		3/12	228-9706			
Perspective Vortex			888-0052			
Phantom BBS		3/12	939-4857			
The Point After		3/12	873-9603			
Private Resort	down SUN	3/12	434-7070			
Protech		3/12	321-1366			
PU BBS (7 bits, no parity)			526-3389			
Questor Project		3/12	681-0670			
RBBS Poco		3/12/24	936-6227			
Realm of the Knights		3/12	946-8530			
Saga	5p-11p		254-1670			
Sanctuary			873-2453			
Shortcircuit		3/12	594-4615			

This BBSlist has been rid of space-wasting info, and formatted for 40 columns by Highway Star.
If no baud rate is listed beside a board, it is 300 baud only.
If no hours are listed, the board is 24 hours; or, possibly, the hours are unknown.

By Fred Nachbaur

Before I get on with it, let's lay to rest a point of semantics regarding this machine. I've heard it called the PC8300, IQ8300, Power 3000, and have heard rumours about yet other names. I decided to go with the legend on the artwork of the actual PC board, which says "PC8300." So that's what we'll call it from now on.

Further investigation into the PC8300 has brought to light some additional info on this truly unusual computer.

Firstly, we are virtually certain that the character patterns ARE contained in the custom logic chip. Apparently, communication to the logic chip (as for getting the character patterns during printer operations) is done by I/O. Specifically, port F6 seems to be used for this. Note that this is an EVEN-number port; apparently the ports are decoded more completely than on the machine's ancestor.

Another new port, F5, is used for the sound commands. The other ports (tape, TV and printer) are apparently the same as on the ZX81/TS1500 family.

The design of the display system appears to preclude the use of 64K packs of any kind. (The exception might be John Olliger's since it allows the 48-64K block to be switched out; however, being fully decoded, it too may not work.) This is not to say that such packs might not be modifiable to work on this machine.

Several people (including myself) have tried using a TS1000 or TS1500 ROM on this machine. It works, sort of. The character set remains the same, unfortunately; so you still have goof-ball games critters instead of pound, colon, question-mark and the grey graphic square. The other grey graphics are still right-angle triangles.

More importantly, there is a problem with the display routines. Each row of characters is "tilted", odd rows one way and even rows the other. The overall effect was described by one fellow as "flagging," as it looks a bit like a flag in the wind. In FAST mode, it actually moves around. Very annoying, practically unusable.

We're presently investigating the feasibility of creating a "Timex-compatible" ROM that behaves just like a ZX81 except for the display routines. [I've gotten it to work fine in SLOW mode, but am still having trouble with FAST mode.] The prospect of a switchable ROM add-on is not out of the realm of possibility. Unfortunately, Wilf Rigter assures me that there is virtually no possibility of modifying the machine (in either hardware or software) to successfully run WRX16-based high-resolution programs. Pity.

On the other hand, "high resolution capability" is claimed for the machine. We'll just have to wait and see what we and others can find out about this.

MORE SYSTEM VARIABLE PROBLEMS

In addition to the system variable discrepancies reported in the last issue, there are a few more that bear pointing out. The B_REG variable is now also used for some rather important flags. MODE is now used differently than before, and VERS is an important variable. What it does exactly we haven't figured out, but it seems to be involved in knowing whether to clear memory on reset, or to leave memory alone (as when a program is present).

SOME USEFUL ROM CALLS

As indicated earlier, the PC8300 ROM is nothing like the ZX81 ROM, though it does (by sheer necessity) bear the occasional resemblance. Nonetheless, the differences are even greater than between the ZX/TS and the Spectrum. Even the "Forth-like calculator language" uses a completely different set of codes for its various commands! So even if you have Hot Z and try to make sense of the calculator routines, all you'll get is trash.

The biggest problem hackers will have in adapting ZX81 software to this machine, is that the location of the common ROM calls is completely different than you're used to. Here is a listing of some of the more likely routines to be useful. Addresses are in hexadecimal.

```

0765 BEEP
076A NOBEEP
0000 ER_BEEP (the raucous noise on error in SLOW, or short "blip" in FAST)
12A5 SLOW
005E FAST
0F20 NEW
1C5E SCROLL
0A4A PRINT
1C7D CLS
143C CLEAR
1CC3 COPY
14FF UNSTACK A
1509 UNSTACK BC
140D ERROR STOP (code no. in A)
1487 PRHL (print HL as a 4-digit decimal no.)

```

I've also found the entry points of the other BASIC commands. You can do the same by referring to Ray Kingsley's article in *SUN* Vol. 2:1. You will need to know that the command token table is at 1504 (gives the sequence of the commands in the offset table), the offset table is at 1A0E (actually starts at 1A0B for INK, PAPER and BORDER). Finally, the command parameters and addresses are given in the table at 1B02.

THE RESTARTS

As mentioned, except for RST 00h and RST 38h (defined by hardware; 00 is reset, 38 is the interrupt vector), the restarts are nothing like what you're used to.

RST 00h is a rather fancy reset routine. How it discriminates between power-up and hitting the reset button is probably a topic for an entire article in itself.

RST 08h (formerly the error restart) is now analogous to the old RST 20. Similarly, RST 10h (formerly the print-character restart) is comparable to the old RST 18 statement parser. RST 18 is now the PRINT CHARACTER IN A restart.

RST 20h now unstacks the top floating-point entry into BC, DE and A (comparable to the old UNST routine). RST 28h is a bit of a mystery; all it does is check bit 7 of B_REG. What does this mean? That's the mystery at this point.

Finally, RST 30h is what RST 28h is on the ZX/TS; the entry to the FP calculator. Again, however, the way the FP calculator is implemented is quite different from the ZX/TS, so you're unlikely to find this useful until someone figures out what all the command codes are.

OTHER POINTS OF INTEREST

Aside from the tables pointed out above, here are a few more you might find interesting. 13E7 is the keyboard codes table (used in the DCOD routine). 140E are the shifted keys. 1581 are the function tokens (the first letter of each token has bit 6 high as a "start flag"). 17E5 are the report codes. 1BF4 are the FP interpreter commands jump table; this is where you'd start figuring out the FP codes. For instance, code 1 seems to be DUP, 2 appears to be 0?, etc. 1097 is a "mystery table." Perhaps involved in PLOT (or perhaps not?). Two other mystery tables are at 1E3D and 1E61. 1900 appears to be the MUSIC lookup table. There may be other tables or patches of data (aside from FP code following RST 30h) that I haven't isolated yet.

HARDWARE POINTS

DO NOT try to plug a Sinclair ULA into the custom chip socket of the PC8300! Disaster is almost certain; the pinouts aren't even similar.

The clock "crystal" (located at the pin 21 end of the CPU) is the same junky 6.5 MHz. "ceramic IF filter" as used on the ZX81/TS1000 (poor frequency stability). Incidentally, these were intended for FM radios, not computers. Is it replaceable with a real crystal? Well, maybe; all three pins are used, so it's a little dubious. This would be something for an enterprising hardware hacker to play with. If you CAN get a 6.5 MHz. crystal (perhaps as salvaged from a dead 1500) to work, you might try to find a 7.8 MHz. crystal, and replace the CPU with a 2808. This will have two major effects, if it works: 1) the frame rate will now be 60 Hz. instead of 50 Hz., eliminating any vertical hold problems and incidentally making PAUSE time-out properly. 2) The machine will run 20% faster; this WILL bring the overall speed very close to 2 times the speed of the ZX81/TS1000! (See also below, "How Much Faster is Faster?")

If you do a lot of hardware hacking on this machine, consider soldering a SIP (single in-line pin) header to the keyboard tails, and install a matching header to the PCB to allow easy disconnection of the keyboard.

As mentioned, I/O port decoding must be better than on the ZX/TS since it seems to allow even port addresses. This could cause trouble with some add-ons which RELY on incomplete decoding; e.g. the Zebra joystick interface. On the other hand, it opens up a lot of other neat possibilities.

AN INTERESTING MODIFICATION

Between the ROM socket and the speaker you will see a little diode, and a legend on the artwork saying "UK ONLY." Remove the diode (or simply desolder one end). This will make the machine run at 60 Hz.! (And, incidentally, make the PAUSE command time-out correctly.)

Also, it makes the sound commands (SOUND, MUSIC, and the keyboard beeps) corresponding higher and faster; I prefer it this way, since it makes the keyboard sounds somewhat less annoying. Thanks to John Stewart at WOAI in San Antonio for pointing this out; I would have thought that this would have no effect on frame rate. This teaches one not to take ANYTHING for granted with this machine!

HOW MUCH FASTER IS FASTER?

So, if you can simply clip a diode to make the machine run at 60 Hz., why bother with Z80B's and faster crystals? The answer has to do with the way the display is created. The Z80 itself generates the display, on both the PC8300 and on the ZX/TSs. By displaying the picture only 50 times a second instead of 60, more time is available for computing. As it turns out, the machine runs about 1.5 times faster overall at 50 Hz. compared to 60 Hz.!

This is of course true of the ZX/TS also; British games that reviewers reported as "extremely fast" are only "sort-of-fast" on American machines... because of the 50/60 Hz. question.

So if your TV/monitor doesn't mind, LEAVE THE DIODE CONNECTED (or install one, if yours happens to have it omitted or removed). You might want to install a switch to experiment with both "modes."

This is why I called clipping the 50/60 Hz. diode only an "interesting" modification, rather than calling it "recommended." Clipping the diode will, indeed, make your TV or monitor happier. However, it will slow down the machine considerably, making it only slightly faster than a ZX/TS.

Notice that it still will be "slightly" faster, overall, even in 60 Hz. mode. This is primarily because the screen-handling routines no longer have to cope with that silly compressed display file. CLS and SCROLL, especially, are what they should have been all along. However, even PRINT (and of course the PRINT CHARACTER restart, RST 18) is slightly faster as a result of simplifying the display handling.

The rest of the commands, especially the floating-point commands (the arithmetic operators, functions, etc.) are about the same as the ZX/TS. After all, doing a Chebyshev polynomial takes a certain amount of time at a given clock rate, no matter how it's re-arranged.

Will we come up with an "ultimate ZX," complete with full ZX/TS compatibility but with greater speed, sound, colour options, and on and on? Possibly, but don't hold your breath. If only the PC8300 had appeared in 1982, it might still be a powerful force in the Western computing community. As it stands, however, the public has been inundated with "superior" machines that no-one REALLY understands; so much that the return to "elegance in simplicity" is difficult if not impossible. Still, we'll do what we can. Stay tuned!



Saving Memory


Because the standard 2K byte Timex/Sinclair 1000 has limited memory capacity, the conservation of memory space is important. A program that wastes precious memory space—and uses all of it—may of necessity be shorter than a program that uses all of that space sparingly. For a given memory capacity, space-saving programs can mean longer programs, which, in turn, may mean more interesting programs that do more.

The following are programming techniques and strategies for conserving memory space on the T/S 1000:

1. Use short variable names. For example, use **M** instead of **MONTHLY PAYMENT**.
2. Eliminate **REM** statements.
3. Reuse variables.
4. Use **CLEAR** to clear space used by variables.
5. Use **CLS** to clear the TV screen and display a file.
6. Use predefined constants rather than defining them.

Constant	Use
0	PI-PI

PI-PI requires 3 bytes. An even shorter way of expressing it would be to use **NOT PI**.

Note: To see the symbol **PI**, press **SHIFT** and **ENTER** to get the  cursor. Then press only the **M** key, labeled **PI** below.

Constant	Use
1	PI/PI

7. For general constants up to 255, use **CODE**. Refer to Appendix A for the appropriate character codes.

Constant	Use
28	CODE "0"
29	CODE "1"
50	CODE "M"
66	CODE "PI"
128	CODE BS

In the last example, the graphics character of the black square (inverse video blank) was used. Of course, **CODE ""** (blank) can be used for 0, but this notation uses 4 bytes instead of the 2 bytes used by **NOT PI**.

8. Use **VAL** instead of numbers. For example, use **VAL "8000"**

instead of the number 8000. The computer will evaluate the **VAL** of the string "8000" and return the number 8000. **VAL** is a more general way of saving memory than **CODE** because number strings of any length can be used. **CODE** is restricted to numbers from 0 to 255. Not all of these

numbers are available because no characters are defined for codes 67 through 111 and 122 through 125, whereas other codes correspond to nonprinting characters, such as **BREAK**.

VAL can also be used with expressions. To round off numbers at several places in a program, use a character string as the rounding function. For example, the following program rounds off input numbers **X** to 2 decimal places:

```
10 LET A$="INT(100*X+.5)/100"
20 PRINT "X=?";
30 INPUT X
40 PRINT X
50 PRINT VAL A$
60 GOTO 20
```

Try running this program for 1.555. The result will be 1.56. The function **VAL A\$** will round off the value of **X** to 2 decimal places. To round off numbers in 10 lines, use **VAL A\$** in those 10 lines—or anywhere else that rounding is needed. Set the **X=value** to be rounded, then do a **VAL A\$**.

9. Use a single **PRINT** statement wherever possible rather than multiple **PRINT**'s. For example,

```
10 PRINT "CHECKS-1"
20 PRINT "DEPOSITS-2"
```

can be replaced by

```
10 PRINT "CHECKS-1","DEPOSITS-2"
```

10. Use **AND**, **NOT**, and **OR** whenever possible rather than **IF**. For example,

```
IF INKEY$="6" THEN LET X=X+1
```

can be replaced by

```
LET X=X+1 AND INKEY$="6"
```

which is one byte shorter.

Also, in an **IF**, to check to see if a number is greater than 0, use

```
IF X THEN GOTO 50
```

which saves 8 bytes, instead of

```
IF X>0 THEN GOTO 50
```

If the **IF** test is true, then the test is equal to 0.

11. Make a program end with the last line rather than using a **STOP** in the program. For example, instead of

```
10 PRINT 2+2
20 STOP
```

use

```
10 PRINT 2+2
```

The logic of a program can also be rearranged to end without a **STOP**.

12. Use parentheses as little as possible because the symbols () use memory space for storage and execution. Parentheses also slow down program execution because the computer must store temporarily the results during execution.

13. Use numeric and string variables in a program when employing the same constants in several places. For example,

```
10 LET A=5.35
20 LET N$="CHECK"
```

substitutes A for 5.35 throughout the program. Similarly, for the string "CHECK" use N\$.

14. If you are really cramped for memory, define program variables using the direct keyboard input of their values. For example, instead of

```
10 LET A=2000
20 PRINT 2*A
```

use

```
10 PRINT 2*A
```

then

```
LET A=2000
GOTO 10
```

Using **RUN** here will produce an undefined variable message because the value of A was not defined in a statement.

15. Use slices to store data in variables. For example, to store the following,

```
X(1)=13
X(2)=18
X(3)=27
X(4)=19
```

use

```
10 DIM X(4)
20 LET A$="13182719"
30 FOR I=1 TO 4
40 LET X(I)=VAL A$(2*I-1 TO 2*I)
50 NEXT I
```

Slicing can also be used to assign strings and characters.

Of course, for the simple example above, four **LET** statements would need less memory. However, the slicing technique is advantageous when much data must be assigned.

16. Use concatenation to construct numbers. For example, when the numbers 205, 5.35, and 2055.35 must be used many times in a program, use

```
10 LET X$="205"
20 LET Y$="5.35"
30 LET W$=X$+Y$
```

Now W\$ is the string "2055.35" by concatenation, which saves 4 bytes of memory, compared to a line like

```
30 LET W$="2055.35"
```

Notice that because every character following the equal sign takes up one byte of memory, the X\$+Y\$ is 4 characters shorter than "2055.35." Again, use judgment in deciding whether it is more economical to concatenate or define directly.

17. Use BASIC tokens in strings as much as possible rather than spelling out each letter. For example, to print "RUN PROGRAM," it is not necessary to spell out each letter in RUN, as in

```
PRINT "RUN PROGRAM"
```

Instead, use

```
PRINT "RUN Program"
```

to enter RUN as a token.

1. Press **SHIFT** and **THEN**.
2. Press **RUN** keyword.
3. Press **SHIFT** and the **5** key to lock the **⏏** cursor before **RUN**.
4. Press **SHIFT** and **DELETE** to delete the **THEN**.

This trick with **THEN** can be used to enter keywords and then delete the **THEN**. Of course, once **THEN** is entered, it does not have to be entered again. For example, to print the words **THEN STOP**, just use

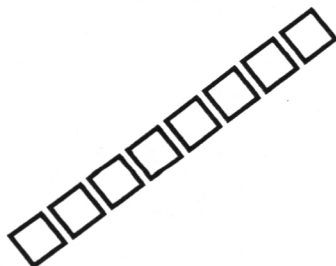
```
PRINT "THEN STOP"
```

Note that the BASIC shifted words, such as **AND**, **STOP**, etc., can be directly entered by pressing **SHIFT** and the word, even with the **⏏** cursor.

Similarly, the shifted functions under the keys can be entered directly. Try entering

```
PRINT " AND NOT STOP "
```

The string between quotation marks uses only 3 bytes with BASIC tokens, compared to the 14 bytes the string would need if each letter and space were entered separately.



by James G. DuPuy

Here is a short program for the 2068 that will create a label for your cassettes. It's really nice to have all your cassettes labeled, indexed, and all the same! Make sure that your program titles aren't over 10 characters long or they will be cut to 10. After the label is printed, just tare it off and fold it so it fits the case.

[illegible]

Your tape TITLE

```

10 REM TAPE LABEL By James G.
DuPuy 2-5-85
12 PRINT AT 10,0;"STOP TAPE AN
D TURN ON PRINTER!!!"
13 BEEP .5,30
14 PRINT AT 14,0;"Press ENTER
to Start."
15 POKE 23809,20

```

Reprinted from the July 1985 issue of TIMELINES, the joint newsletter of the three TS User Groups in the San Francisco Bay area.

```

16 PRINT AT 16,0;"To skip to s
ide B or to skip   side B, just
enter ""STOP"" by   holding th
e Sym.Shift and press the ""A""
key at the program titlepromps."

```

```

10 INPUT Z$
20 BORDER 5: BRIGHT 1: CLS
30 DIM N$(10)
35 PRINT AT 0,0:"";
TAB 31:"|";
40 PRINT AT 2,0:"";

```

```

50 FOR n=3 TO 19
60 PRINT AT N,0;"|";AT N,15;"|";
";AT N,31;"|";
70 NEXT N
80 PRINT AT 3,4;"Side:A";AT 3,
20;"Side:B"
85 FOR n=5 TO 19
90 PRINT AT n,1;"_____";
";AT n,16;"_____";
100 NEXT n
120 PRINT AT 21,2; FLASH 1;"Enter Tape Title or Number."
130 INPUT a$: IF a$="" THEN GO TO 130
135 PRINT AT 1,2;a$
140 LET o=1
150 FOR n=5 TO 19
155 PRINT AT 21,0;" "
160 PRINT AT 21,0; FLASH 1;"Enter Title for Side A #:";o
170 INPUT n$: IF n$="" STOP
" THEN GO TO 210
178 PRINT AT n,1; OVER 1;n$
180 PRINT AT 21,0; FLASH 1;"Enter Index Number for #:";o
185 INPUT i$
190 PRINT AT n,11; OVER 1;">";i$
192 INPUT "OK (ENT/N) ";Z$: IF Z$="N" OR Z$="n" THEN PRINT AT N,1; OVER 1;n$;AT N,11; OVER 1;">";i$: GO TO 155
195 LET o=o+1
200 NEXT n
210 LET o=1
215 FOR n=5 TO 19
220 PRINT AT 21,0;" "
230 PRINT AT 21,0; FLASH 1;"Enter Title for Side B #:";o
240 INPUT n$: IF n$="" STOP
" THEN GO TO 295
245 PRINT AT n,16; OVER 1;n$

```

XX

The DATES have been set, and we are happy to announce them. The SUNSTATE T/S WINTERFEST '88 will be March 4-6, 1988 in sunny Orlando, Florida.

The advance reservations are now being accepted with the following fee schedule: Pre-paid will be \$5 single, \$9 family; at the door \$8 single, \$12 family. To register send your name(s), address and phone number to:

Sunstate T/S Winterfest '88

249 N. Harden Ave.

Orange City, Fl 32763

Make checks payable to :

Northeast Florida T/S Users Group

We are using their checking account to make things easier, as they are one of the host groups.

The fee schedule for the vendors will be as follows: pre-paid; \$50 per table and \$65 per table at the door. There are plenty of tables available.

The SUNSTATE T/S BULLETIN SERVICE is still up and running at (904) 775-0093 with a minor change. The parameters are 8-1-none. We have also expanded the BBS by switching to a different software setup. The new BBS has multiple message bases, and upload/download capabilities. Call in and check it out, feel free to leave the sysop any suggestions.

The Orlando Marriott Hotel, a large luxury hotel has been chosen for our Winterfest site. This hotel has 4 lighted tennis courts, 3 large outdoor pools, 2 kiddie pools, and a hydrotherapy pool, plus a beautiful winding jogging path. The meeting rooms are large with lots and lots of electrical outlets, as the hotel is used to having computer classes in the rooms. As we all know the winter months in Florida is the peak tourist season and this will be no exception. The hotel has given the Winterfest '88 a convention rate of \$90 for a single or double while triple or quad will be \$105 per night. This is a quality hotel of the finest standards. The hotel needs the first night deposit and will accept American Express, Visa, Mastercard, Diners Club, enRoute and Carte Blanc along with personal checks. We will be trying to match up people who would like to share a room with others to cut costs. They need to call the BBS and leave a message. When making a reservation with the Orlando Marriott be sure to mention the SUNSTATE T/S WINTERFEST '88 to receive the special convention rate, their number is (305)351-2420. For information concerning other hotels in the immediate area of Fest please call our BBS at the above Number.

SEE YOU ALL THERE MARCH 4-6, 1988 /

Reprinted from the Oct/87 issue of THE SINC TIMES

HOW SLOW IS IT?

by Mel Richardson

It has been written many times that Sinclair floating point arithmetic is awfully slow. But it's accurate! is sometimes exclaimed in defence. Well, just how slow and accurate is it? In the March 87 issue of SKY & TELESCOPE, T.S. Kelso of Austen TX presents a Basic version of a program outlined in BYTE, Vol 10, No. 11, 1985 called the "SAVAGE BENCHMARK". A Sinclair version is presented below that should be usable on all our machines and provide some interesting comparisons.

The principle of the program is 2499 iterations of three pairs of complementary functions (tan/arctan, exponent/log, square root/square). The number "1" is sent through this grinder and incremented by 1 each time. The correct result of course is 2500 and the computed result will indicate accuracy while the time taken to compute can noted.

Results are given for some computers described as follows: A Z80A system using CPM 2.2 and single precision produced 2304.86 in 4M 20S. Compiled and with double precision gave 2499.999999869949 in 38M 22S and the same system with Turbo Pascal produced 2500.0046341 in 6M 41S. A system with an 8086 processor running at 8mhz using MS-DOS 2.11 produced 2500.004634 in 1M 59S, and with an 8087 numeric processor added gave 2500.0000000118 in 6 seconds. An IBM PC-AT running at 8mhz answered 2500.004634 in 54 seconds. My T/S 1000 in FAST mode with a Z80B produced a respectable 2499.6758 in a modest 15m 29s. There you have it. Not too bad for an unenhanced basic.

For some perspective, it is reported in the same journal that the mighty CRAY X-MP/24 struggled for .7463S to answer 2499.999999999999 etc. Terrific.

```
1 REM SAVAGE BENCHMARK-
2 CLEAR
3 LET A=1
4 FOR I=1 TO 2499
5 LET A=TAN (ATN (EXP (LN (SQ
6 (A*A)))))+1
7 NEXT I
8 PRINT A
```

PIE CHART PROGRAM

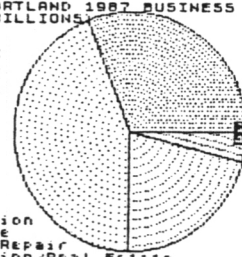
The Editor

This program will make up to and including 18 slices. It also displays a slice number, the value you input and the % of the whole.

```
1 RUN 400: REM for pie chart
  with up to 18 pieces of pie
  240 FOR r=1 TO ra STEP RND*6+.7
  : FOR p=as TO ae STEP d*(40/r):
  PLOT r*COS p+xc,r*SIN p+yc: NEXT
  p: NEXT r: RETURN
  399 REM add a '' for N$ for ea
  ch name line over 1. Normal is 2
  for 1 line.
  400 INPUT 'PIE CHART NAME? ':N$
  : CLS : PRINT N$' ''# val r%':
  INPUT 'how many divisions? ':di
  v
  401 LET total=0: DIM d(div)
  402 FOR a=1 TO div: INPUT 'ente
  r value for division #':(a);' ':
  d(a): LET total=total+d(a): PRIN
  T a;TAB 3;d(a): NEXT a
  1100 LET xc=168: LET yc=88: LET
  ra=87: CIRCLE xc,yc,ra
  1200 LET ang=0: FOR s=1 TO div
  1400 PRINT AT s+2,8;INT (d(s)/to
  tal*100+.5)
  2050 LET d=(RND*6+.7)*.01745
  2200 LET as=ang*.01745
  2210 PLOT xc,yc: DRAW ra*COS as,
  ra*SIN as
  2220 LET ang=ang+d(s)/total*360
  2300 LET ae=ang*.01745
  2400 GO SUB 240
  2440 NEXT s
  3000 PRINT TAB 2;''-----': PRINT
  TAB 2;total;AT 10,30; INVERSE 1;
  1;AT 11,30;div
  3100 REM add necessary LPRINTs t
  o describe item #s within space.
  3333 STOP
  9999 SAVE 'piechart'
```

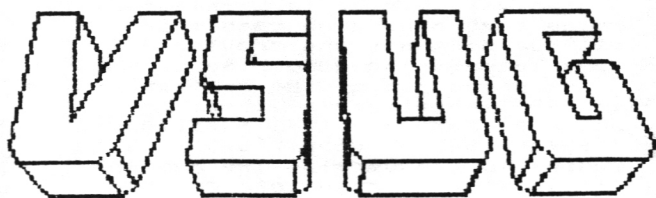
PORT OF PORTLAND 1987 BUSINESS
(MILLIONS)

#	val	r%
1	31	31
2	44	44
3	21	21
4	4	4
	100	



#1=Aviation
#2=Marine
#3=Ship Repair
#4=Planning/Real Estate

Reprinted from the October/87
issue of the Plotter



The Vancouver Sinclair Users Group has been in existence since 1982. We are a support group for the owners and users of all SINCLAIR and TIMEX computers

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